Evaluating Rabies Risk Exposures

Presenter:

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Goals

- Ensure appropriate treatment of individuals who may have sustained unreported or incompletely treated rabies risk exposures
  - Ensure assessment is routine part of post-deployment evaluations
  - Ensure appropriate care for persons identified with risk (theater encounter, PDHA/PDHRA responses, self report)
- Ensure all persons presenting with rabies risk exposures receive appropriate care

Agenda

- Review of rabies epidemiology, disease and treatment
- Approach to preventive care for risk exposures
  - Acute presentations
  - Delayed presentations
- Resources

Human Rabies Update

- A US Soldier died from rabies in AUG 2011
  - Acquired from a dog bite while deployed in Afghanistan
  - First case in DoD in over 30 years
  - Symptoms began 3 months after redeployment
  - AR 15-6 investigation currently ongoing

- Public health investigation into case revealed 11 other Soldiers in unit had sustained <u>unreported</u> and <u>untreated</u> rabies risk exposures
  - Mostly dog bites
  - Several persons had more than one exposure
  - 10 required post-exposure prophylaxis

Rabies Outside United States

- 55,000 people die of rabies world-wide every year
  - US typically reports only 1-2 human cases per year
  - Dogs are the most common vector in developing countries
    - Lack of vaccination programs
    - US travelers may not realize risk
  - Fewer than 10 survivors known
- Once symptoms develop, almost uniformly fatal
  - Early treatment prevents nearly 100% disease
  - Treatment before symptoms begin can still be effective
    - Most survivors had some history of vaccination
    - Only three survivors with no prior history of preventive care
- <u>CDC guidance is written primarily for risk in US, not other countries and not for military deployments!</u>

Rabid Animals

PHOTO: CDC PHIL

PHOTO: U.S. ARMY

You cannot tell whether an animal has rabies by observing its actions.

Both of these dogs have rabies.

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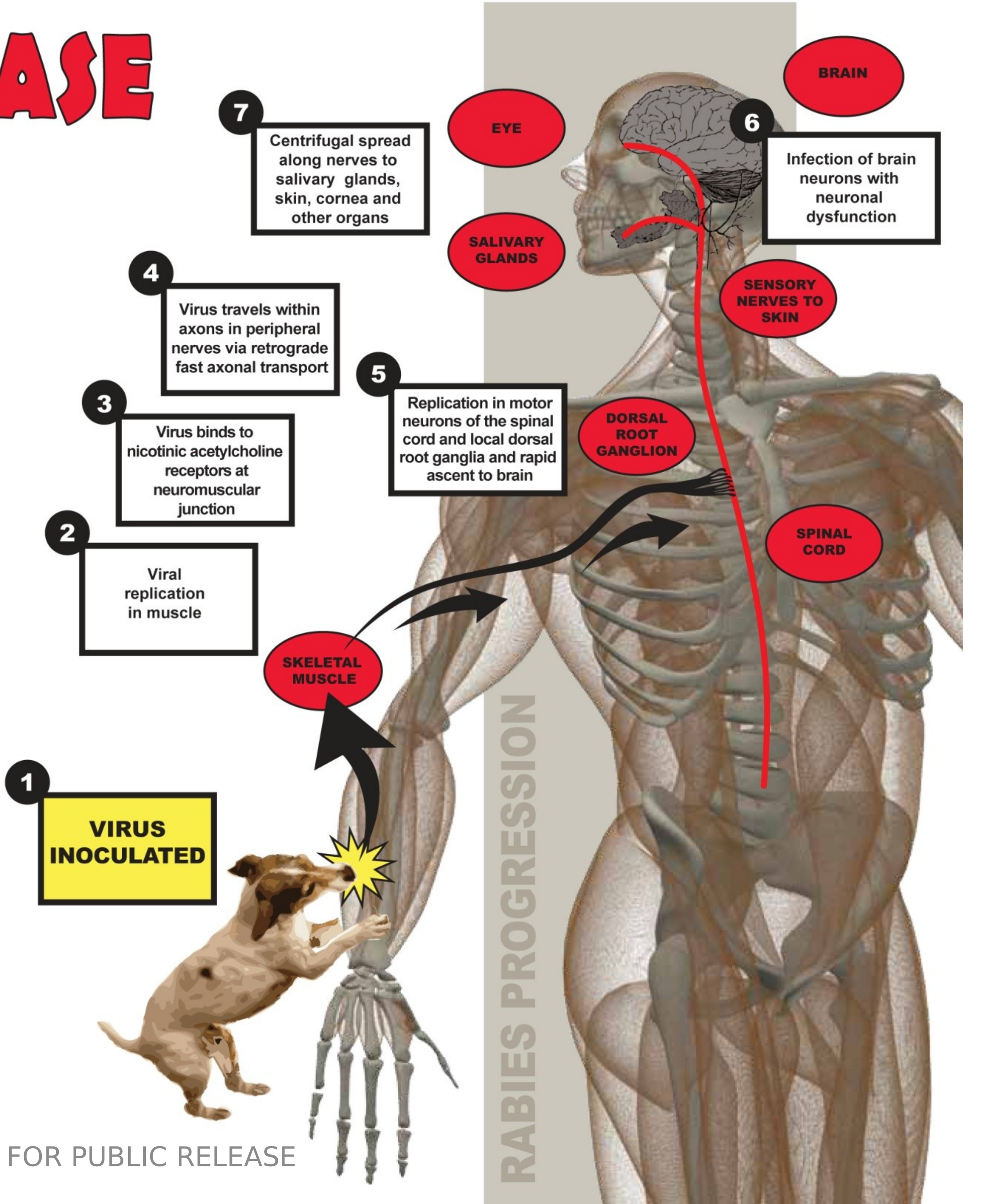
Rabies Disease

- Caused by RNA viruses in the family Rhabdoviridae, genus Lyssavirus
- Virus is transmitted through contact with the saliva of infected, or rabid mammals, such as dogs, cats, bats, skunks, raccoons, foxes, mongooses and jackals
  - Mice, rats and other small rodents are almost never found to be infected with rabies.
  - Larger rodents, such as groundhogs or beavers, can be infected
  - Herd animals, such as horses, cows, etc., can be infected
- In CNS, virus causes acute, progressive encephalomyelitis
- Incubation period: Average 1 to 3 months after untreated exposure
  - Most people who develop rabies do so in 12 months
  - Can be only days; rarely longer than one year after exposure
  - Depends on virus inoculum, distance from CNS and other factors
  - Bites to the head or neck usually have the shortest incubation periods

RABIES DISEASE

- Early symptoms include flu-like symptoms, pain or paresthesias at bite site
- Progresses to anxiety, confusion and agitation
- Encephalitic vs. paralytic forms
- Hydrophobia: Rabies disease can result in painful spasm of breathing muscles with attempts to drink, leading to conditioning
(person becomes afraid to drink)



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Rabies Diagnosis & Treatment

- Combination of tests needed to confirm diagnosis ante-mortem
  - No single test is sufficient
  - Saliva: Virus isolation or RNA detection with RT-PCR
  - Serum & spinal fluid: Antibodies to rabies virus
  - Punch skin biopsy of neck: Detect rabies antigen in cutaneous nerves of hair follicles
- Once symptoms begin, no known effective treatment
  - Care is primarily supportive; ICU care required
  - Experimental administration of anti-viral drugs
  - Suppression of brain activity with sedatives may help reduce inflammatory effects of virus
- **The best treatment is PREVENTION**
  - Thorough cleansing of wounds as soon as possible
  - Timely completion of vaccine series and administration of human rabies immunoglobulin as appropriate

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Rabies Post-Exposure Prophylaxis (PEP), United States, 2010

Vaccination status	Intervention	Regimen*
Not previously vaccinated	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent (e.g., povidine-iodine solution) should be used to irrigate the wounds.
	Human rabies immune globulin (HRIG)	Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated around and into the wound(s), and any remaining volume should be administered at an anatomical site (intramuscular [IM]) distant from vaccine administration. Also, HRIG should not be administered in the same syringe as vaccine. Because RIG might partially suppress active production of rabies virus antibody, no more than the recommended dose should be administered.
	Vaccine	Human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) 1.0 mL, IM (deltoid area†), 1 each on days 0,§ 3, 7 and 14.¶
Previously vaccinated**	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidine-iodine solution should be used to irrigate the wounds.
	HRIG	HRIG should not be administered.
	Vaccine	HDCV or PCECV 1.0 mL, IM (deltoid area†), 1 each on days 0§ and 3.

* These regimens are applicable for persons in all age groups, including children.
† The deltoid area is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.
§ Day 0 is the day dose 1 of vaccine is administered.
¶ For persons with immunosuppression, rabies PEP should be administered using all 5 doses of vaccine on days 0, 3, 7, 14, and 28.
** Any person with a history of pre-exposure vaccination with HDCV, PCECV, or rabies vaccine adsorbed (RVA); prior PEP with HDCV, PCECV or RVA; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

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Rabies and Deployment

- Although rabies can infect any mammal, mice, rats and other small rodents are almost never found to be infected with rabies. These bites do <u>not</u> require rabies prophylaxis.
- Other than military working dogs, there are no “safe” dogs or cats when deployed.
  - **~10% of animals tested from Afghanistan were positive**
- Vets in theater do not routinely vaccinate feral

PHOTO: CDC PHIL

A rabid dog, cat, or monkey can look and **behave** normally —even during a veterinary exam. The rabid dog above is calm with advanced disease.

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Rabies and Deployment

- General Order #1 prohibits the keeping of stray animals as pets or mascots by US Service members.
- Poor camp sanitation and actively providing food/water to feral animals increases the threat.
- Although well-meaning family members may send vaccine, lack of temperature control during transport renders it impotent.
- Take all reports of bites, nips or contact with the saliva of warm-blooded animals, such as dogs, cats, bats, monkeys, & jackals seriously and treat accordingly.
- The act of biting increases the pre-test probability the animal is rabid.

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Overview: Evaluating Acute Exposures

-Patient presents with obvious bite or shortly after event-

- All bites MUST be appropriately documented in AHLTA
  - A template is being developed to ensure complete history is captured and appropriate ICD9 and CPT codes are captured
- All suspected rabies exposures MUST be treated with Human Rabies Immunoglobulin (HRIG) and Rabies Vaccine as appropriate
  - CDC algorithm is appropriate for evaluating exposures sustained in US, Australia, Western Europe, Japan, Korea, Bahrain and Singapore
  - A more conservative approach is appropriate for exposures sustained elsewhere; start PEP if animal anything other than MWD
  - PEP may be discontinued if animal remains healthy after 10-day period of quarantine or lab testing of animal is negative
  - Contact Preventive Medicine if there are questions about animal exposures or procedures to prevent rabies

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Overview: Evaluating Acute Exposures

-Patient presents with obvious bite or shortly after event-

- Animal Bite Report (DD 2341) MUST be completed and sent to veterinarian
  - Ensure patient information, especially contact information, is correct in case person needs to be contacted later
  - Get as much information as possible regarding the biting animal. Veterinarians must try to locate the animal for quarantine.
  - Copy should also be scanned into AHLTA
- Preventive Medicine will coordinate with veterinarians to convene a Rabies Advisory Board to review all cases.

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Treatment of Animal Bite or Other Rabies Risk Exposure

- Copiously wash out wound for at least 15 minutes
- If **not immunized previously:**
  - Give human rabies immunoglobulin (**HRIG)**, 20 IU/kg
  - Infiltrate wound with as much HRIG as possible - give excess IM in **deltoid** or **anterior-lateral aspect of the quadriceps (thigh)**
  - Give **1.0 ml rabies vaccine IM** in **other deltoid**—be sure site is distal from HRIG injections!
  - **Series requires minimum of 4 vaccinations on days 0, 3, 7, and 14**
    - 5th dose on day 28 recommended for immunosuppressed persons or those on anti-malarials (standard for US forces in Afghanistan)
- If patient reports **previous rabies immunization:**
  - HRIG should NOT be given—may interfere with natural antibody production
  - Give 2 vaccinations on **days 0 and 3**; 1.0 ml IM in **deltoid**

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Monkey Bites: Special Considerations

- Macaque monkeys are native to central and Southeast Asia, including eastern Afghanistan, and are often kept as pets.
- Monkeys in the macaque group can carry Simian Herpes B virus (SHBV).
  - A rare but highly fatal encephalomyelitis in humans (up to 80% of cases)
  - Infected monkeys may be able to transmit SHBV but not show clinical signs

http://wwwnc.cdc.gov/eid/article/18/10/12-0419-f1.htm

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Monkey Bites: Special Considerations

- Treatment for bites by macaque monkeys should include:
  - Immediate wound/mucous membrane cleansing for at least 15 minutes
  - Antiviral medication within 24 hrs to 5 days of the bite (see below)
  - Baseline testing for antibodies against SHBV
  - Rabies post-exposure prophylaxis (PEP)
  - Ensure SM's tetanus status is current
  - Consider antibiotic prophylaxis for prophylaxis of skin infections with oral flora
  - Follow-up testing for SHBV seroconversion should be done at 2, 4 and 6 weeks and finally 3 months after exposure.
- Consult infectious disease physicians for questions.
- Use either Valacyclovir or Acyclovir for prophylaxis.
  - Valacylovir—1g by mouth every 8 hours for 14 days, or
  - Acyclovir—800 mg by mouth 5 times daily for 14 days
- Neither is contraindicated with RIG or rabies vaccine.

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AHLTA Documentation

- Document **circumstances** of exposure, including date, location and activities leading to exposure
  - Enables Rabies Advisory Board to evaluate exposure risk
  - Helps to corroborate veterinary reports and lab results
- Document any **wounds**, including location
- Document **prior rabies vaccinations**, **current medications** and **medical conditions**
  - Prior rabies vaccinations and/or HRIG immunization
  - High-dose steroid or other immunosuppressive therapies or medical conditions require 5 vaccine doses instead of 4 (e.g., taking malaria pills)

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AHLTA Documentation

- Record treatment provided
  - **Copious washing** of wound for **> 15 minutes**
  - Administration of **HRIG**
  - Vaccine inoculation site
  - **Lot number** and **expiration date**
- Document plan for subsequent vaccination
  - If providing vials for administration at forward location, document **cold chain plan** (between 36 and 46 °F)
  - Provide **contact number** to track case to completion
  - Public health nurses can assist with ensuring follow-up
- Document any reasons for discontinuing vaccination series

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MEDPROS Documentation

- All HRIG and rabies vaccine doses must be entered into MEDPROS or other Service-specific immunization tracking program
  - Active duty, Reserve or National Guard
  - DA civilians who are deployable
  - DoD contractors eligible for care in theater

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Evaluating Past Exposures
-Patient presents for care well after event-

- All risk events MUST be appropriately documented in AHLTA
- All suspected rabies exposures MUST be treated with HRIG and Rabies Vaccine as appropriate
  - There is **no time limit** for treatment with HRIG and vaccine
    - Infiltrate site of wound or exposure with HRIG, even if injury is healed
    - Remainder of HRIG should be administered in other deltoid or anterior-lateral aspect of the quadriceps (thigh) region, distal from vaccination site
  - Only persons who have received previous rabies vaccinations should not receive HRIG
  - See algorithm for additional details
- Report case to Preventive Medicine/Public Health at military treatment facility to ensure patient receives appropriate follow-up
- Preventive Medicine will coordinate with veterinarians to convene a Rabies Advisory Board to review all cases

Evaluation and Treatment of Potential Deployment-Related Rabies Exposures

IMPORTANT: THIS ALGORITHM SHOULD NOT BE USED TO EVALUATE ACUTE BITES OR EXPOSURES[1]

Note: This algorithm is primarily intended to apply to risk exposures reported after a delay and associated with deployments to countries with Intermediate or High Rabies Risk as assessed by NCMI.

NOTE: Providers who have questions or concerns regarding application of this algorithm should contact their local Rabies Advisory Board for assistance.

Did the patient have contact with a mammal capable of spreading rabies?[2]

YES

Did the patient sustain a bite that broke the skin, a scratch that bled, or have wet animal saliva contact mucous membranes or broken skin or have a bat in sleeping quarters?

- **NO** → **NO Rabies PEP Indicated** Document the incident and clinical assessment in AHLTA.

YES/UNSURE

Was the animal a US/NATO military working dog?

- **YES** → **NO Rabies PEP Indicated** Document the incident and assessment in AHLTA. Code exposure[3] and use supplemental codes E906 for dog bite, or E906.5 for injuries due to monkey or other animal as appropriate.

NO/UNSURE

Was the animal directly observed for 10 days following the exposure and appeared healthy at day 10?

- **YES** → **NO Rabies PEP Indicated** Document the incident and assessment in AHLTA. Code exposure[3] and use supplemental E codes as appropriate.

NO/UNSURE

Is appropriate Rabies Post Exposure Prophylaxis (PEP) for this exposure documented in the medical record?[4]

- **YES** → **NO Rabies PEP Indicated** Document the incident and assessment in AHLTA. Code exposure[3] and use supplemental E codes as appropriate.

NO

Rabies PEP MAY Be Indicated

- **Administer both Human Rabies Immunoglobulin (HRIG) and rabies vaccine regardless of time since incident unless patient has previously received rabies vaccine series. HRIG should not be given more than 7 days after first vaccine dose if the patient already received some rabies vaccine.**
- **Document exposure incident, assessment, and treatment in AHLTA. Use appropriate wound code and supplemental E codes, as well as code V04.5.**[3] **Document HRIG and rabies vaccines in Service immunization tracking system.**

PEP Regimens[5] (also see next page)

Not previously vaccinated:

RIG: 20 IU/kg body wt at site of wound and any remaining volume distal to rabies vaccine site

Rabies Vaccine[6]: 1ml IM days 0, 3, 7, and 14 (Also day 28 if immunosuppressed or on antimalarials)

Previous vaccine series or titer documented:

HRIG should not be used.

Rabies vaccine only: 1ml IM days 0 and 3

1. For acute bites and exposures, refer to http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm and http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm. These guidelines apply to the US. Do not apply them too strictly to persons who sustain exposures in countries with higher rabies risk.
2. Dogs, cats, bats, raccoons, skunks, ferrets, and wild terrestrial carnivores. Rodents are not reservoirs of rabies virus. Small rodents (e.g., squirrels, chipmunks, rats, mice, hamsters, guinea pigs, and gerbils) and lagomorphs (including rabbits and hares) are rarely infected with rabies and have not been known to transmit rabies to humans.
3. Use codes 870.0-897.7 (wound, open) or 910-919 (superficial injury codes) with the appropriate supplemental code: E906 for dog bite or E906.5 for injuries due to monkey or other animal. Include code V04.5 for animal bite requiring rabies vaccination. 4.See protocols on next page.
5. If the vaccine series was interrupted for more than a few days or not completed, providers should complete the series and then assess immune status by performing serologic testing 7–14 days after administration of the final dose in the series. If drawing a titer is not practical or feasible, restart the vaccine series (but do NOT administer HRIG).
6. Purified Chick Embryo Cell Vaccine (PCECV) should not be given to individuals with egg allergies. Human Diploid Cell Vaccine (HDCV) is safe in egg-allergic individuals.

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Resources

Local Preventive Medicine/Public Health/Veterinary Officers

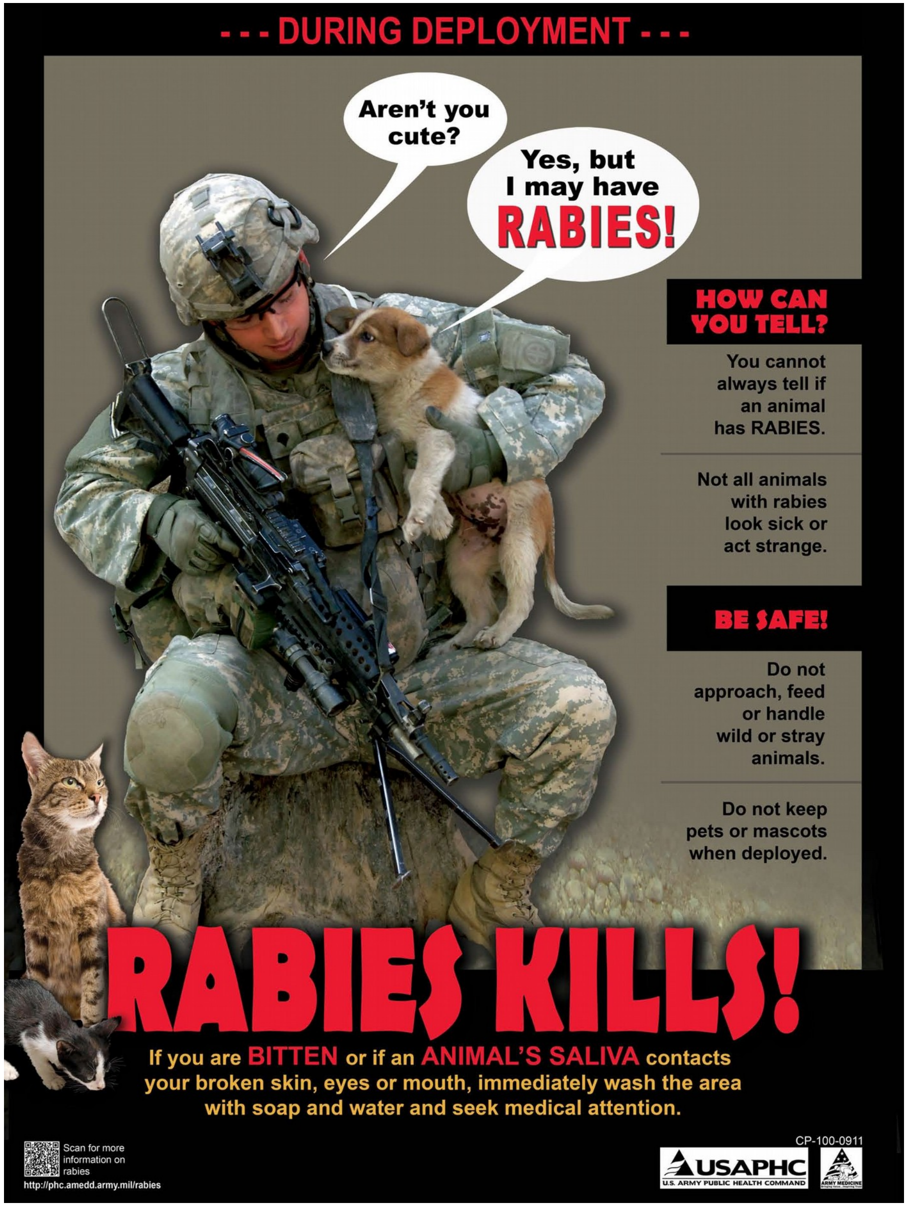
- Phone:
- Email:

US Army Public Health Command Rabies Response Team

- Phone: (800) 984-8523 OR DSN 312-421-3700
- Email: PHCRabiesInfo@amedd.army.mil
- http://phc.amedd.army.mil/topics/discond/aid/Pages/Rabies.aspx

References

- US Centers for Disease Control and Prevention (CDC) Rabies Website http://www.cdc.gov/rabies/
- MMWR: March 19, 2010 / 59(RR02); 1-9: Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm
- MMWR: May 23, 2008 / 57(RR03); 1-26,28: Human Rabies Prevention --- United States, 2008 http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm
- USAPHC Rabies Fact Sheet available at Rabies Response Team webpage


- - - DURING DEPLOYMENT - - -
Aren't you cute?
Yes, but I may have RABIES!
HOW CAN YOU TELL?
You cannot always tell if an animal has RABIES.
Not all animals with rabies look sick or act strange.
BE SAFE!
Do not approach, feed or handle wild or stray animals.
Do not keep pets or mascots when deployed.
RABIES KILLS!
If you are BITTEN or if an ANIMAL'S SALIVA contacts your broken skin, eyes or mouth, immediately wash the area with soap and water and seek medical attention.
Scan for more information on rabies
http://phc.amedd.army.mil/rabies
CP-100-0911
USAPHC
U.S. ARMY PUBLIC HEALTH COMMAND

- - - DURING DEPLOYMENT - - -
Cute, aren't they?
BUT THEY COULD BE
DEADLY!
ABOUT RABIES
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